

6.3 Polar Coordinates

Target 10D: Understand the Polar Coordinate System by performing Polar/Rectangular Coordinate Conversions

Review of Prior Concepts

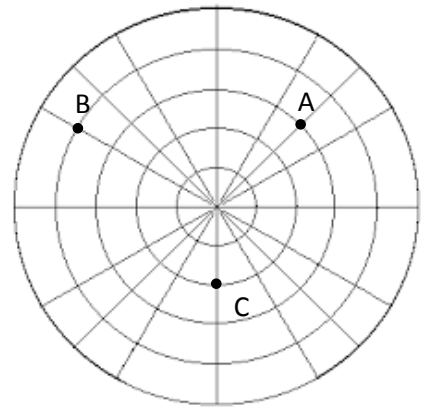
1. Find the magnitude of the vector $\langle \sqrt{3}, 1 \rangle$. 2. Find the direction angle of the vector $\langle \sqrt{3}, 1 \rangle$.

Polar Coordinates

 (r, θ) The polar coordinates of point A is $(3, 45^\circ)$ or $(3, \frac{\pi}{4})$.

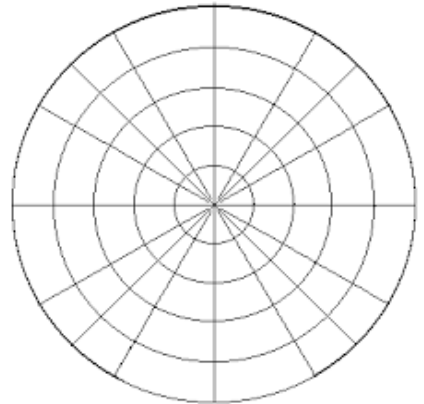
Example 1: Identify the coordinates of:

- a) point B
b) point C

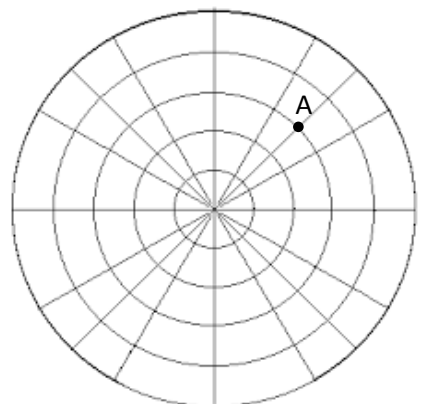


Example 2: Plot each of the given points:

- a) D $(5, \pi)$
b) E $(-2, \frac{\pi}{3})$
c) F $(3.5, -\frac{\pi}{6})$

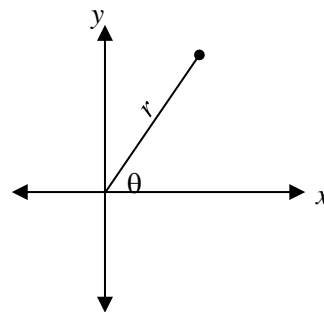


Example 3:

Determine the rectangular (x, y) coordinates of point A.

Convert Polar Coordinates to Rectangular Coordinates

$$(r, \theta) \rightarrow (x, y)$$

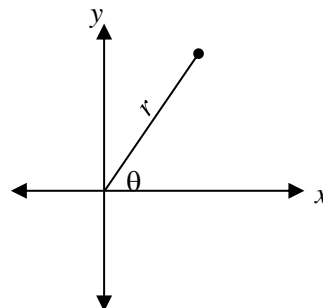


Example 4:

Convert $(2, \frac{5\pi}{6})$ to rectangular coordinates.

Convert Rectangular Coordinates to Polar Coordinates

$$(x, y) \rightarrow (r, \theta)$$



Example 5:

Convert $(3\sqrt{2}, 3\sqrt{2})$ to polar coordinates.

More Practice

Polar Coordinates

http://mathinsight.org/polar_coordinates

<https://www.mathsisfun.com/polar-cartesian-coordinates.html>

[http://math.illinois.edu/~rasekh2/math231\(s2016\)/PolarEquations.pdf](http://math.illinois.edu/~rasekh2/math231(s2016)/PolarEquations.pdf)

<http://tutorial.math.lamar.edu/Classes/CalcII/PolarCoordinates.aspx>

http://www.mathwords.com/p/polar_rectangular_conversion_formulas.htm

<https://youtu.be/r0fv9V9GHdo>

<https://youtu.be/jexMSISDubM>

<https://youtu.be/2RQk9P-EVpQ>

<https://youtu.be/L4v98ZZft68>

Homework Assignment

p.539 #1-7 odd,13,15,21,27,29